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Plenary of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
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Item 5 of the provisional agenda*

Report of the Executive Secretary on the implementation of the first work programme for the period 2014–2018

Information on work related to knowledge and data (deliverables 1 (d) and 4 (b))

Note by the secretariat

1. In section II of its decision IPBES-2/5 on the work programme for the period 2014–2018, the Plenary of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) established a task force on knowledge and data for the period 2014–2018, whose terms of reference are set out in annex III to that decision. The primary purpose of the task force is the implementation of deliverables 1 (d) and 4 (b) of the first work programme.

2. In section II of its decision IPBES-3/1, the Plenary approved the data and information management plan for 2015 set out in annex II to the decision and requested the secretariat to submit to the Plenary, for information, data and information management plans for each ongoing assessment and to develop data and information management plans in the context of any scoping process or report. Activities to be undertaken under the data and information management plan in 2016 were set out in appendix II to the note by the secretariat on an update on the work of the task force on knowledge and data submitted to the Plenary at its fourth session (IPBES/4/INF/7). In order to implement the data and information management plan in 2016 and to more effectively fulfil its mandate, the task force on knowledge and data established three task groups – subgroups of the task force consisting of members of the task force and resource persons – on (a) indicators and data for IPBES assessments, (b) web-based infrastructure in support of data and information management needs, and (c) knowledge generation catalysis.

3. In section III of its decision IPBES-5/1, the Plenary took note of the outline workplan for the task force on knowledge and data for 2017 and 2018, set out in annex III to the decision. The Plenary also requested the task force, subject to the availability of resources, to further develop the outline workplan with clear deliverables and milestones for 2017 and 2018, taking into account the comments received during the fifth session of the Plenary, in consultation with relevant multilateral environmental agreements, international processes and organizations, to provide further updates during the intersessional periods through the Platform website and to report on progress to the Plenary at its sixth and seventh sessions. The Plenary encouraged the task force to develop terms of reference to specify the modalities of its collaboration on specific tasks with partner organizations.

4. The annex to the present note, which is presented without formal editing, sets out information on progress made by the task force on knowledge and data in its work and on activities planned for 2018.

* IPBES/6/1

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Annex

Information on work related to knowledge and data

I. Overview

1. After the fifth session of the Plenary, the task force on knowledge and data continued to work in the three task groups established in 2016 on (a) indicators and data for IPBES assessments, (b) web-based infrastructure in support of data and information management needs, and (c) knowledge generation catalysis. In sections II to VI below, information is set out on activities undertaken in relation to these three areas of work and activities planned to be implemented between the sixth and seventh sessions of the Plenary.

II. Guidance and support regarding the use of indicators in IPBES assessments

A. Introduction

2. According to its terms of reference, the responsibilities of the task force on knowledge and data include to advise on the indicators and metrics to be used in IPBES products and on the standards necessary for capturing and managing associated data (decision IPBES-2/5, annex III, section B, paragraph (d)).

3. The work of the task group on indicators comprises three main elements: (i) guidance on core and highlighted indicators for use in IPBES assessments, including on social-ecological bundles of indicators, (ii) collaboration with organizations that have developed the selected indicators regarding the provision of information and data related to those indicators, and (iii) the provision of tailored support to assessment authors regarding the use of indicators.

4. In decision IPBES-3/1, the IPBES Plenary approved the undertaking of four regional assessments of biodiversity and ecosystem services and of the assessment of land degradation and restoration, in accordance with the procedures for the preparation of the Platform's deliverables and as outlined in the scoping reports for the assessments set out in annexes III to VIII to that decision, for consideration by the Plenary at its sixth session. The generic scoping report for the regional assessments states, among other things, that the assessments will draw on a wide variety of data sets addressing all the specific components of the conceptual framework, and that a common framework on data standards developed by the knowledge and data task force will be applied to all assessments in order to facilitate intraregional, interregional and subregional comparisons.

5. In decision IPBES-4/1, the IPBES Plenary approved the undertaking of a global assessment of biodiversity and ecosystem services in accordance with the procedures for the preparation of the Platform's deliverables and as outlined in the scoping report for the assessment set out in annex I to that decision, for consideration by the Plenary at its seventh session. The scoping report mandated the assessment expert group to draw on data and information from diverse knowledge systems, addressing all the components of the conceptual framework in order to explore the interrelationships between nature, nature's benefits, drivers and human well-being. It also sets out that the task force on knowledge and data will provide active guidance on data and information quality, confidence, indicators, baselines and representativeness for the assessment, and that a core set of indicators with appropriate baselines will be used consistently across the global and regional/subregional assessments and will be closely aligned with existing international frameworks.

6. In response to its mandates, the task force on knowledge and data developed a list of 30 core indicators, which authors were urged to use in addition to other indicators or data sources they may choose, and 42 highlighted indicators, which authors may be interested in using, but with no expectation regarding their consistent use in the assessments. The lists were approved by the Multidisciplinary Expert Panel following its seventh meeting, held in Bonn in June 2016 and were set out in appendices III and IV to document IPBES/5/INF/5.

B. Progress achieved and next steps planned in supporting experts working on assessments regarding the use of IPBES core indicators

7. Since the fifth session of the Plenary, the task group on indicators, supported by the technical support unit on knowledge and data, developed a set of standardized visualizations for those core indicators, for which data is currently available. The visualizations were intended to support assessment authors in the communication and interpretation of status and trends of biodiversity and ecosystem services as described by indicators at the global, regional and sub-regional levels. The visualizations were meant to enable the consistent and appropriate representation of indicator information across all chapters and assessments.

8. A first draft of the visualizations for 17 out of 30 indicators was made available to assessment authors and to indicator data providers for their review in the beginning of April 2017. By September 2017, the visualizations had been revised in response to comments received by authors and data providers. Visualizations for 9 further indicators also had been prepared. Following further comments provided by authors and indicator providers, a fully revised version of visualizations for the 26 core indicators, for which data is currently available, was made available in November 2017 to the authors of the regional assessments of biodiversity and ecosystem services, the assessment of land degradation and restoration, and the global assessment of biodiversity and ecosystem services.

9. The visualizations provided for use in assessments include visualizations of the indicators at the global, regional and sub-regional level. For most indicators both area corrected and non-area corrected visualizations were provided. The visualizations show the average indicator value and, where available, temporal trends together with 5th and 95th percentiles. For temporal indicators, LOESS smoothing, a non-parametric form of local regression, was used to illustrate temporal trends in average and percentiles. For some indicators, simple line graphs without LOESS smoothing and without characterization of variance were provided.

10. The process of selecting a set of core indicators for use in IPBES assessments, liaising with indicator providers regarding access to data and preparing a set of standardized visualizations was only finalized at a late stage of the assessment process, therefore the authors of the regional assessments of biodiversity and ecosystem services and of the assessment of land degradation and restoration were not in a position to use all of the core indicators and the standardized visualizations in the assessments.

11. The task group on indicators, supported by the technical support unit, plans the following activities between the sixth and seventh sessions of the Plenary:

(a) Liaison with indicator providers regarding updates in data and resulting updates of the visualizations and communication to assessment authors;

(b) Support to the use of IPBES core indicators and standardized visualizations in the global assessment of biodiversity and ecosystem services:

(i) March-April 2018: support to assessment authors in the preparation of the second order draft of the chapters of the assessment and the first order draft of the summary for policymakers;

(ii) May-December 2018: support to assessment authors in the preparation of the final draft of the chapters of the assessment and the summary for policymakers;

(c) Support, as appropriate, to the use of IPBES core indicators and standardized visualizations in any assessment that the Plenary, at its sixth session, may decide to undertake:

(i) July-September 2018: information to assessment authors at their first author meetings of core and highlighted indicators for use in IPBES assessments and resources and support available to authors;

(ii) September 2018-May 2019: support to assessment authors in the preparation of the first order draft of the chapters of the assessments.

C. Approach to social-ecological bundles of indicators in IPBES assessments

12. The 30 core indicators did not sufficiently cover some of the components of the IPBES conceptu framework (set out in the annex to decision IPBES-2/4), including "nature's contributions to people" an "good quality of life", nor the relationships among the various components of the conceptual framework depicted by its arrows. Therefore, it was noted that complementary socioeconomic indicators were neede to represent those missing aspects of the IPBES conceptual framework. First steps were undertaken in 2016 to address these gaps (see information document IPBES/5/INF/5). The Multidisciplinary Expert Panel, at its 8th meeting, requested the continuation of the work on additional indicators with a socioecological focus for use in the global assessment for an even coverage of the IPBES conceptual framework, including the development of narratives to illustrate their role.

13. To support this requested further work, IPBES, with financial support from the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and SwedBio, convened a workshop on 6 and 7 April 2017 in Budapest, Hungary, back-to-back with a workshop of the values expert group that addressed the consideration of the conceptualization of multiple values in the global assessment of biodiversity and ecosystem services, and a meeting dedicated to advance indigenous and local knowledge across the chapters of the global assessment. The workshop resulted in the conceptualization of a more general approach to bringing together biophysical and socio-economic aspects, using the concept of bundles (i.e. sets) of indicators to integrate indicators representing different dimensions of a specific theme. The workshop participants illustrated the approach by selecting exemplary social-ecological bundles of indicators for five themes (biodiversity, global commons, health, food security and telecoupling). The list of participants in the workshop is contained in appendix I.

14. In response to the mandates of the task group on indicators and of the global assessment of biodiversity and ecosystem services, a follow up workshop was organized in Seoul, Republic of Korea, from 5 to 7 December 2017, with financial support from the Ministry of the Environment of the Republic of Korea, to pilot, test and further develop the approach regarding social-ecological bundles of indicators for a specific theme emerging from the global assessment, and to reflect on the use of social-ecological bundles of indicators in future IPBES assessments. The specific theme chosen for the piloting exercise wa the relationship between biodiversity and food, with particular attention to two main dimensions: production sustainability, access and diversity. The piloting exercise was expected to contribute, where feasible, to the preparation of the second order draft of the global assessment. The list of participants is set out in appendix II. It reflects the dual mandate to which the workshop was intended to respond, and included members of the Bureau, the Multidisciplinary Expert Group, the IPBES task group on indicators, the expert group undertaking the global assessment and, responding to the request from the IPBES Plenary for consultation with relevant multilateral environmental agreements, international processes and organizations, and a number of resource persons.

15. The outcomes of the workshop include the following:

(a) A preliminary list of dimensions (elements or components that define the theme that are relevant when considering the theme), sub-bundles (more specific issues that are components of the theme and more easily compartmentalized as sub-elements to the major theme), and indicators related to the relationship between biodiversity and food: sustainable production, diversity and access, for further consultation with experts within and outside of IPBES;

(b) Proposed guidance on the use of social-ecological bundles of indicators in future IPBES assessments, set out in appendix III, for consideration by the Multidisciplinary Expert Panel, with a view to the inclusion of the guidance into the IPBES guide for assessments.

16. The following activities are planned to be undertaken between the sixth and seventh sessions of the Plenary under this workstream:

(a) Further development of the list of dimensions, sub-bundles and indicators related to the relationship between biodiversity and food:

(i) February-March 2018: Consultation of the list by experts within and outside of IPBES;

(ii) End of March 2018: Finalization of a draft list of dimensions, sub-bundles and indicators based on inputs received during the consultation phase under the guidance of the co-chairs of the task force on knowledge and data, the members of the

Multidisciplinary Expert Panel that attended the workshop in Seoul, and the co-chairs of the global assessment;

(iii) June 2018: Endorsement of the list of dimensions, sub-bundles and indicators by the Multidisciplinary Expert Panel.

(b) Support, as appropriate, to the use of social-ecological bundles of indicators in the global assessment:

(i) March 2018: submission of the draft list of dimensions, sub-bundles and indicators to global assessment experts for their consideration and use in the assessment, as appropriate;

(ii) March-November 2018: Support, as feasible and appropriate, to authors of the global assessment in using the identified indicators in the global assessment from the technical support unit on knowledge and data;

(c) Support, as appropriate, to the use of the approach to social-ecological bundles of indicators in any assessment that the Plenary, at its sixth session, may decide to undertake, including:

(i) July-September 2018: Information of assessment authors at their first author meetings regarding the approach and resources and support available to authors;

(ii) September October 2018: A workshop with the task group on indicators and a limited number of assessment experts representing the various chapters to apply the approach to social-ecological indicators to these assessments, in line with the approach set out in appendix III, with the following objectives:

a. Identification of a bundle (i.e. a small set) of socio-economic and ecological key indicators for each theme emerging from the first author meetings (drawn from the lists of core and highlighted indicators, but also other data sources, that help to show status, trends and interlinkages, and can inform on the different perspectives of any one particular issue);

b. Identification of key aspects in the themes, for which there are no indicators currently available, and for which information on status and trends comes from other sources;

c. Identification of gaps, i.e. aspects of the themes for which no information sources are available;

d. Identification of relevant data providers.

(iii) October 2018 – May 2019: Support, as feasible and appropriate, to authors of the assessments in using the identified indicators in the assessments from the technical support unit on knowledge and data.

III. Web-based infrastructure in support of data and information management

17. According to its terms of reference, the responsibilities of the task force on knowledge and data include to support the secretariat in overseeing the management of the data, information and knowledge used in developing IPBES products so as to ensure their long-term availability and to identify opportunities for increasing access to existing data, information and knowledge. The task group on web-based infrastructure, since the fourth session of the Plenary, has conceptualized and overseen the development of web-based infrastructure as part of the IPBES website. The infrastructure provides IPBES members with key information, including relevant official documentation, IPBES catalogues, finalized deliverables and other products, and IPBES experts with information pertaining to their work, and the possibility of contacting relevant experts and stakeholders.

18. In July 2017, the new IPBES website was launched, which provides a number of improvements and new features, including:

(a) The catalogue of policy support tools was integrated into the IPBES website at www.ipbes.net/policy-support;

(b) Information on experts that serve as members of the Bureau, the Multidisciplinary Expert Panel, IPBES task forces and assessment expert groups, lists of national focal points, and members of the secretariat was centrally stored on the IPBES website. This has improved the management and updating of this information (see www.ipbes.net/experts);

(c) Inputs to and outputs from the IPBES work programme were also centrally stored on the IPBES website (see for example www.ipbes.net/dataset/methodological-assessment-scenarios-and-models-biodiversity-and-ecosystem-services);

(d) The user interface and general engagement of users were improved;

(e) The IPBES mailing list service was integrated as part of the IPBES website;

(f) Reliance on third party software was significantly reduced, e.g. for form submissions, surveys, or discussion forums (see for example www.ipbes.net/forum, also, the catalogue of policy support tools and methodologies is being developed as part of the IPBES website);

(g) Transparency and traceability were increased through indexing and maintenance of relevant logs on web content and activities;

(h) Domain authority and security were increased by ensuring that all links on the website are available and stable; that errors are resolved; down time is prevented; modules are up to date; spam accounts are blocked; and IPBES emails are not labelled as spam by mailing engines;

(i) Responsibilities for content management have been distributed among the secretariat, experts and other stakeholders by using workflows, permissions and user interfaces.

19. The following activities are planned to be undertaken between the sixth and seventh sessions of the Plenary under this workstream:

(a) The reinforced team at the secretariat will:

(i) Design, implement, test and make available for review of the task group additional features on the website;

(ii) Train programme staff at the secretariat and the technical support units to enhance the content of the website;

(iii) Further enhance the accessibility of the website for internal and external users;

(b) The task group on web-infrastructure will continuously review and provide advice on the implementation of these additional elements of the website.

IV. Knowledge generation catalysis

20. According to its terms of reference, the responsibilities of the task force on knowledge and data include to support the Bureau and the Multidisciplinary Expert Panel in reviewing the knowledge needs and gaps identified through Platform scoping processes and assessments and to catalyse the generation of new knowledge and data, in convening dialogues with scientific organizations, policymakers and funding organizations and in undertaking other activities to address those needs identified in the work programme. The terms of reference respond to one of the four functions of IPBES, as set out in the functions, operating principles and institutional arrangements of IPBES (resolution establishing IPBES, document UNEP/IPBES.MI/2/9, annex I, appendix I), which is to identify and prioritize key scientific information needed for policymakers at appropriate scales and catalyse efforts to generate new knowledge by engaging in dialogue with key scientific organizations, policymakers and funding organizations, but not directly undertake new research.

21. In decision IPBES-4/1, the IPBES Plenary approved the summaries for policymakers of the report of the assessment of pollinators, pollination and food production set out in annex II to the decision and the report of the methodological assessment of scenarios and models of biodiversity and ecosystem services set out in annex IV to the decision and accepted the individual chapters of the assessment reports and their executive summaries. In response to decisions IPBES-3/1 and IPBES-4/1, the regional assessments of biodiversity and ecosystems services, the assessment of land degradation and restoration, and the global assessment of biodiversity and ecosystem services are currently ongoing.

22. Between the fourth and the fifth sessions of the Plenary, the task force on knowledge generation had developed a process for catalysing the generation of new knowledge, which was presented to the Plenary in document IPBES/5/5, including the following three steps:

(a) Identification of gaps in knowledge, information and data in the IPBES work programme, and in completed assessments;

(b) Consultation on these gaps and the formulation of priority areas for knowledge generation with the scientific community;

(c) Tailoring of these priority research areas to potential research-funding institutions and their communication to these funding organizations, mainly by means of bilateral meetings.

23. Knowledge gaps were understood in this context to include information and major data gaps pertaining to global biodiversity.

24. Following the fifth session of the Plenary, the three steps were further developed by the task group and presented to the Multidisciplinary Expert Panel and the Bureau at their 9th sessions. The first step, identification of gaps in knowledge, information and data, was set out to include three elements: the development of a draft report on gaps in knowledge, information and data emerging from the assessment, an internal consultation on the report with the assessment experts more widely, and the preparation of a final report from the perspective of the assessment.

25. The Multidisciplinary Expert Panel and the Bureau, at their 9th meetings, decided, considering the good progress made by the expert group on scenarios and models in catalysing the generation of new knowledge based on the scenarios and models assessment (see table 4 on examples of activities catalysed by IPBES in 2017, in document IPBES/6/9), that the process for catalysing the generation of knowledge based on IPBES assessments should be piloted for the pollination assessment.

26. Following the 9th meetings of the Multidisciplinary Expert Panel and the Bureau, the secretariat consulted the co-chairs of the pollination assessment regarding the proposed process. The co-chairs offered to lead a comprehensive process of identifying knowledge gaps and draft research priorities, including a workshop to finalize the identification. This more systematic way of implementing step 1 required more preparatory time and the originally envisaged timeline was shifted allowing for the completion of the report on knowledge gaps emerging from the pollination assessment to be finalized by March 2018.

27. From 27-29 November 2017, a workshop was organized at the University of Reading, United Kingdom, to identify gaps in knowledge emerging from the pollination assessment, to develop next steps for the consultation of the identified gaps emerging from the pollination assessment and their communication and to further develop the general approach to the identification of gaps in knowledge from IPBES assessments. The list of participants in the workshop is set out in appendix IV and includes members of the task group on knowledge generation catalysis, the co-chairs and a number of experts of the pollination assessment and resource persons.

28. The outcomes of the workshop included the following:

(a) A list of gaps in knowledge emerging from the pollination assessment, for further consultation;

(b) Next steps for the consultation regarding the gaps emerging from the pollination assessment and their communication;

(c) A proposal for a further developed general approach to the identification of gaps in knowledge emerging from IPBES assessments, set out in appendix V.

29. The participants of the workshop, under the guidance of the co-chairs of the pollination assessment, identified a list of knowledge gaps emerging from the pollination assessment. As a method, they used a modified Delphi approach for systematic forecasting and built on the experience of team members with similar processes led by the European Union. The modified Delphi method involved experts scoring and commenting independently and anonymously in early rounds of surveys followed by an in-person facilitated discussion of the results at the workshop in Reading. This continuation of the survey in Reading, with a smaller subset of experts, built on a larger process initiated in 2015 with the entire group of authors of the pollination assessment in order to have scores reflect a geographic and expertise balance.

30. The task group on knowledge generation prepared a proposal for a further developed general approach to the identification of gaps in knowledge emerging from IPBES assessments, which is set out in appendix V. The task group recommends focussing on the identification of knowledge gaps throughout the assessment process, and proposes concrete elements to this approach. The Multidisciplinary Expert Panel and the Bureau, at their 11th meetings, will be invited to consider this proposal and whether it should become part of the IPBES guide for assessments.

31. The following activities are planned to be undertaken between the sixth and seventh sessions of the Plenary under this workstream:

(a) Work regarding knowledge gaps and needs emerging from the pollination assessment:

(i) March 2018: Communication of the list of knowledge gaps to governments and stakeholders in preparation for an e-conference to widely consult on these knowledge gaps;

(ii) April 2018: Organisation of an e-conference to widely consult on the list of identified knowledge gaps (pollination assessment) with governments and stakeholders. The e-conference will be facilitated by experts, supported by secretariat;

(iii) May 2018: Revision of the list of knowledge gaps (pollination assessment) under the guidance of the co-chairs of the pollination assessment to reflect the outcomes of the e-conference;

(iv) June 2018: Submission of the revised list of knowledge gaps (pollination assessment) to the Multidisciplinary Expert Panel for their endorsement during their 11th meetings;

(v) July 2018 – May 2019: Engagement, by secretariat, with strategic partners in activities to catalyse the generation of knowledge in the areas endorsed by the Multidisciplinary Expert Panel (pollination assessment);

(b) Work regarding knowledge gaps and needs emerging from the land degradation and restoration assessment:

(i) April 2018-September 2018: Identification by the co-chairs of the assessment of land degradation and restoration of an initial draft set of knowledge gaps arising from that assessment;

(ii) September 2018: Workshop to further identify gaps, based on the draft set of knowledge gaps (land degradation and restoration assessment), with assessment experts, resource persons, and the task group on knowledge generation;

(iii) January 2019: Submission of the revised list of knowledge gaps (land degradation and restoration assessment), to governments and stakeholders in preparation for an e-conference to widely consult on these knowledge gaps;

(iv) February 2019: Organisation of an e-conference to widely consult on the list of knowledge gaps (land degradation and restoration assessment) with governments and stakeholders. The e-conference will be facilitated by experts, supported by secretariat.

(c) Work regarding knowledge gaps and needs emerging from the regional and global assessments:

(i) May-June 2018: Collection of suggestions for broad thematic areas for the identification of knowledge gaps emerging from the regional assessments and the global assessment of biodiversity and ecosystem services during the regional consultations on the second work programme and the second order draft of the global assessment, if the Plenary, at its sixth session, approves such consultations;

(ii) July 2018 – May 2019: Development of a proposal for a comprehensive process to identify knowledge gaps emerging from the regional assessments and the global assessment of biodiversity and ecosystem services in 2019.

(d) Work regarding knowledge gaps and needs emerging from pending assessments to be started in 2018:

(i) July-December 2018: development of an online document survey in support of the ongoing identification of knowledge and data gaps throughout the assessment process;

(ii) 2019: submission of the list of identified knowledge and data gaps to governments and stakeholders, possibly as part of the first peer-review of the assessment draft report;

(iii) Late 2019: summary of lessons learned in the identification of knowledge and data gaps emerging from the pollination assessment, the land degradation and restoration assessment, and the regional and global assessments.

V. Collaboration with partner organizations

32. In its decision IPBES-5/1, the Plenary encouraged the task force to develop terms of reference to specify the modalities of its collaboration on specific tasks with partner organizations. The modalities for collaboration with partner organizations are set out in appendix VI. The text of memoranda of understanding concluded by the IPBES secretariat are available at www.ipbes.net/document-library-categories/agreements. The in-kind contributions of partner organizations are acknowledged in document IPBES/6/9 on financial and budgetary arrangements for the Platform.

VI. Meetings planned for 2018

33. The two workshops suggested for 2018, on indicators and on knowledge generation, are planned to be held back-to-back over five days, with one overlapping day, in September or October 2018. Members of the respective task groups will be invited. Members of the task group on web-based infrastructure will be invited to join either meeting, according to their expertise. A session to reflect on the work of the task force during the first work programme will be organized during the overlapping day.

Appendix I

List of participants in the workshop on IPBES indicators from a socio-economic perspective (Budapest, Hungary, 6–7 April 2017)

	Name	Role	Region
1	Aidin Niamir	Expert, global assessment	Asia-Pacific
2	Alexander Oudenhoven	Expert, global assessment	Western Europe and Others
3	Anna Chenery	Task group on indicators	Western Europe and Others
4	Belinda Reyers	Expert, global assessment	Africa
5	Berta Martin Lopez	Expert, regional assessment for Europe and Central Asia	Western Europe and Others
6	Cornelia Krug	Task group on indicators, resource person, Future Earth	-/-
7	Cynthia Zayas	Expert, global assessment	Asia-Pacific
8	Eszter Kelemen	Expert, regional assessment for Europe and Central Asia	Eastern Europe
9	HyeJin Kim	Resource person, GEO BON	-/-
10	Katia Heubach	Expert, regional assessment for Africa	Western Europe and Others
11	Lucas Garibaldi	Expert, global assessment	Latin America and the Caribbean
12	Marie Stenseke	Multidisciplinary Expert Panel	Western Europe and Others
13	Matthias Schroter	Expert, regional assessment for Europe and Central Asia	Western Europe and Others
14	Nidhi Nagabhatla	Task group on indicators, expert, global assessment	Asia-Pacific
15	Patricia Balvanera	Task group on indicators, expert, global assessment	Latin America and the Caribbean
16	Suneetha Subramanian	Expert, global assessment	Asia-Pacific
17	Susan Preston	Expert group on values	Western Europe and Others
18	Unai Pascual	Multidisciplinary Expert Panel	Western Europe and Others
19	Zsolt Molnar	Expert, global assessment	Eastern Europe
20	Jeong Eun (Anya) Lim	Technical support unit for knowledge and data	-/-
21	Jihyun Yoon	Technical support unit for knowledge and data	-/-
22	David Gonzalez	Technical support unit for values	-/-
23	Sung-Ryong Kang	Technical support unit for knowledge and data	-/-
24	Hien Ngo	Technical support unit for the global assessment	-/-
25	Simone Schiele	Secretariat	-/-

Appendix II

List of participants in the workshop on social-ecological bundles of indicators: Assessing the relationship between biodiversity and food: sustainable production, diversity and access (Seoul, Republic of Korea, 5–7 December 2017)

	Name	Role	Region
1	Youngbae Suh	Bureau, co-chair task force on knowledge and data	Asia-Pacific
2	Marie Stenseke	Co-chair, Multidisciplinary Expert Panel	Western Europe and Others
3	Mark Lonsdale	Multidisciplinary Expert Panel	Western Europe and Others
4	Katalin Török	Multidisciplinary Expert Panel	Eastern Europe
5	Unai Pascual	Multidisciplinary Expert Panel	Western Europe and Others
6	Eduardo Brondizio	Co-chair, global assessment	Latin America and the Caribbean
7	Sandra Díaz	Co-chair, global assessment	Latin America and the Caribbean
8	Cornelia Krug	Task group on indicators, resource person, Future Earth	-/-
9	Nidhi Nagabhatla	Task group on indicators	Asia-Pacific
10	Luthando Dziba	Task group on indicators	Africa
11	Patrick O'Farrell	Expert, global assessment	Africa
12	Aidin Niamir	Expert, global assessment	Asia-Pacific
13	Tuyeni Mwampamba	Expert, global assessment	Africa
14	Osamu Saito	Expert, global assessment	Asia-Pacific
15	Kate Brauman	Expert, global assessment	Western Europe and Others
16	Ralf Seppelt	Expert, global assessment	Western Europe and Others
17	Nora Castañeda	Resource person, Crop Trust	-/-
18	Jessica Raneri	Resource person, Bioversity international	-/-
19	Kwan-Seong Song	Ministry of Environment, Republic of Korea	Asia-Pacific
20	Jieun Yang	Ministry of Environment, Republic of Korea	Asia-Pacific
21	Jeongkyu Kim	National Institute of Ecology	Asia-Pacific
22	Eunjin Park	National Institute of Ecology	Asia-Pacific
23	Min-Hwan Park	National Institute of Ecology	Asia-Pacific
24	HyunSung Shin	National Institute of Ecology	Asia-Pacific
25	Jackie Kang	Technical support unit for knowledge and data	-/-
26	Jihyun Yoon	Technical support unit for knowledge and data	-/-
27	Jeong Eun (Anya) Lim	Technical support unit for knowledge and data	-/-
28	Sarang Lee	Technical support unit for knowledge and data	-/-
29	David Gonzalez	Technical support unit for values	-/-
30	Simone Schiele	Technical support unit for the global assessment	-/-
31	Hien Ngo	Secretariat	-/-

Appendix III

Proposed guidance on the use of social-ecological bundles of indicators in future IPBES assessments

1. The workshop on social-ecological bundles of indicators "Assessing the relationship between biodiversity and food: sustainable production, diversity and access" organized in Seoul, Republic of Korea, from 5 to 7 December 2017, had the objectives to pilot, test and further develop the approach regarding social-ecological bundles of indicators for a specific theme emerging from the global assessment; and to reflect on the use of social-ecological bundles of indicators in future IPBES assessments. As outcome of their deliberations under the second objective, the participants in the workshoprecommend a question-driven approach for future IPBES assessments, and suggest the following elements for consideration by the Multidisciplinary Expert Panel and the Bureau, with a view to their possible inclusion as part of the guide for assessments:

(a) The scoping document is the foundation of an IPBES assessment. The scoping document presents several policy-relevant questions, derived, e.g., from scenarios, the conceptual framework, a survey of the relevant initiatives or consultations with different groups of stakeholders, that should be addressed by the assessment. The identification of major themes for an assessment and the associated needs for indicator and data analysis could commence as part of the scoping process.

(b) In the meeting of the management committee of an assessment that is held in preparation of the first author meeting of the assessment, the scoping document questions could be discussed, and refined if needed, to ensure that they provide good guidance. In doing, so the management committee could also identify preliminary themes to be addressed by the assessment. For each of these themes, an overarching set of questions could be formulated, capturing the essence of the problems addressed, including the linkages to globally agreed goals relevant to the assessment, such as the SDGs, relevant UN Resolutions, targets under the Strategic Plan for Biodiversity, etc.

(c) At the first author meeting, the draft preliminary themes and questions could be discussed, as preparation for a key task of this meeting: the development of a framework for the summary for policymakers. Sub-themes could be identified by each chapter.

(d) For each theme, a bundle (i.e. a small set) of socio-economic and ecological key indicators could be identified, using the IPBES conceptual framework as a guide. These bundles may be drawn from the existing IPBES list of core and highlighted indicators, but also from other data sources, that help to show status, trends and interlinkages (e.g. feedback loops), and can inform on the different perspectives of any one particular issue (e.g. different world views, different stakeholders, different knowledge systems). Key aspects in the themes, for which there are no indicators currently available, and for which status and trends have to be searched for in other ways, could also be identified. Gaps could also be identified and additional experts brought on board in a timely fashion as authors. Relevant data providers would be identified at an early stage, partnerships built and syntheses based on existing data could be conducted.

(e) None of this process would preclude the emergence of new questions at a later stage, which would of course require new sources and new bundles of indicators.

(f) At the second author meeting, the drafts of the summaries for policymakers could be expanded with interim answers to the key questions based on the work done so far. These would be reviewed at this meeting and modified as necessary.

(g) The major themes would form the backbone of the assessments. The themes and indicators identified would be used across chapters where appropriate. The themes and the bundles of indicators would serve as an important base for the summary for policymakers and the corresponding visuals.

2. In summary, the participants in the workshop recommend for future IPBES assessments, to:

(a) Ensure that specific policy-relevant questions are included in the scoping report for consideration by the Plenary;

(b) Develop a draft framework for the summary for policymakers early in the assessment process, e.g. at the first author meeting, unpacking the set of policy-relevant questions, into major themes for the assessment, and relevant sub-themes for each chapter;

(c) Identify, based on that framework for the summary for policymakers, early in the assessment process, the bundles of indicators needed and existing related data and analyses to support the evidence-base for the summary for policymakers;

(d) Ensure, early in the process, that necessary expertise across disciplines, datatypes and sources of knowledge is available in the expert group to support the assessment process, and fill gaps in expertise as appropriate.

Appendix IV

List of participants in the workshop on identification of gaps in knowledge from IPBES assessments (Reading, UK, 27–29 November 2017)

	Name	Role	Region
1	Simon Potts	Assessment co-chair	Western Europe and Others
2	Vera Imperatriz-Fonseca	Assessment co-chair	Latin America and the Caribbean
3	Colleen Seymour	Assessment expert	Africa
4	Michael Lattorff	Resource person	Africa
5	Steven Johnson	Resource person	Africa
6	Damayanti Buchori	Assessment expert	Asia-Pacific
7	Jiandong An	Resource person	Asia-Pacific
8	Yong Jung Kwon	Resource person	Asia-Pacific
9	Parthiba Basu	Resource person	Asia-Pacific
10	Thingreiphi Lungharwo	Resource person	Asia-Pacific
11	Aniko Kovacs	Assessment expert	Eastern Europe
12	Leonardo Galetto	Assessment expert	Latin America and the Caribbean
13	Lucas Garibaldi	Assessment expert	Latin America and the Caribbean
14	Marcelo Aizen	Assessment expert	Latin America and the Caribbean
15	Adam Vanbergen	Assessment expert	Western Europe and Others
16	Barbara Gemmill-Herren	Assessment expert	Western Europe and Others
17	Brad Howlett	Assessment expert	Western Europe and Others
18	Lynn Dicks	Assessment expert	Western Europe and Others
19	Tom Breeze	Assessment expert	Western Europe and Others
20	Deepa Senapathi	Resource person	Asia-Pacific
21	Andras Baldi	Task group on knowledge generation catalysis	Eastern Europe
22	Catherine Laurent	Task group on knowledge generation catalysis	Western Europe and Others
23	Nidhi Nagabhatla	Task group on knowledge generation catalysis	Asia-Pacific
24	Mialy Andriamahefazafy	Task group on knowledge generation catalysis	Africa
25	Cornelia Krug	Task group on knowledge generation catalysis, resource person, Future Earth	n/a
26	Tim Hirsch	Task group on knowledge generation catalysis, resource person, Secretariat of the Global Biodiversity Information Facility	n/a
	Monica Kobayashi	Resource person, Secretariat of the Convention on Biological Diversity	n/a
27	Sarang Lee	Technical support unit for knowledge and data	n/a
28	Hien Ngo	Secretariat	n/a
29	Thomas Koetz	Secretariat	n/a

Appendix V

Proposal to further develop the approach to catalyse the generation of new knowledge

This appendix presents the outcome of the meeting of the task group on catalyzing the generation of new knowledge, which met in Reading, UK, 27-29 November 2018. This draft will be considered by the Multidisciplinary Expert Panel and the Bureau at their next meeting in June 2018.

A. Introduction and general considerations

1. The IPBES approach to identifying knowledge gaps and needs and catalysing knowledge generation should be transformational and shape future directions of research and other forms of knowledge mobilization and generation relevant to biodiversity, its sustainable management and nature's contributions to people. Identified knowledge gaps needs should therefore include:

(a) Gaps/needs related to policy formulation and implementation at various levels of governance, including local, national regional and global levels;

(b) Gaps needs to be addressed during assessment process; gaps to be addressed in the medium-term (within 5 years); and in the long-term (within 10 years and beyond);

(c) Gaps/needs from various scientific disciplines, including natural and social sciences and humanities, and from different knowledge systems, including indigenous and local knowledge;

(d) Gaps/needs relating to the availability and accessibility of data, research and understanding of a topic, and the capabilities and infrastructure to address knowledge gaps/needs;

(e) Gaps/needs relating to access, mobilisation and generation of knowledge and data;

(f) Gaps needs ranging from broad, general areas to more specific aspects and topics.

2. The knowledge gaps and needs identified through the approach should be addressed to:

(a) Organizations mobilizing or generating knowledge and data;

(b) Organizations funding activities to mobilize or generate knowledge and data; and

(c) Users of knowledge and data that will have been mobilised or generated based on the gaps and needs identified by IPBES.

3. These organizations and users include scientific organisations, natural history museums, organisations mobilising citizen science as well as indigenous and local knowledge, funding organisations, the private sector and policymakers and other practitioners.

4. To strengthen the process regarding its relevance and effectiveness it is suggested that representatives covering the range of these actors should be integrated and engaged within the processes from the beginning.

5. The approach to identifying knowledge gaps and catalysing knowledge generation focuses currently on the identification of knowledge gaps arising from the assessment process. In the future, appropriate ways could be developed to include knowledge gaps and needs emerging from other functions of IPBES, in particular related to policy support tools and capacity building.

B. Identification of knowledge gaps

6. The first step of the process that had been presented in document IPBES/5/5, work on knowledge and data (deliverables 1 (d) and 4 (b)), was the identification of gaps in knowledge, information and data in the IPBES work programme, and in completed assessments. It is suggested to begin identifying knowledge gaps at the scoping stage.

7. The IPBES conceptual framework serves as frame of reference for the identification of knowledge gaps. In the case of assessments, the process of identifying knowledge gaps should be further guided by the scope of each assessment and in particular by the key policy relevant questions of the assessment.

8. The task group on knowledge generation recommends that this step could commence during the assessment process and, where feasible, even during the scoping phase of an assessment and include the following elements:

(a) Ongoing identification of knowledge gaps by experts throughout the assessment process:

(i) During the scoping process of an assessment, experts could be encouraged to identify knowledge needs and major gaps related to the proposed key policy-relevant questions being developed as part of the scoping report;

(ii) In the beginning of the assessment process, the scoping document, and in particular the key policy-relevant questions set out in the scoping document, could be used to further identify the knowledge needed and available to answer these questions;

(iii) At an advanced stage of an assessment process, the confidence levels of the key messages can indicate knowledge gaps where the level of agreement or the quantity or quality of the evidence are low;

(iv) Gaps related to relevant issues that cannot be covered by key messages due to a lack of information could be identified throughout the assessment process;

(b) Ongoing recording of knowledge gaps throughout the assessment process:

(i) Knowledge needs and major gaps identified as part of the scoping process could form part of the scoping report;

(ii) An easily accessible online document survey, structured to reflect the overall scope of the assessment and all relevant elements to be captured by the identification of gaps (see paragraph 11), could be made available to assessment authors to record any gaps identified throughout the assessment process;

(iii) The lists of gaps identified by assessment experts could become part of the material submitted for peer-review of the first and second order drafts of the assessment;

(c) Addressing knowledge gaps:

(i) Some gaps identified in the beginning of the assessment process and communicated as part of the scoping report or of the review of the first order draft of an assessment could be addressed within the timeframe of an assessment;

(ii) The gaps identified during the assessment process that still exist once the assessment has been approved, would be consolidated in a comprehensive list and form the basis for the consultation in the next step.

C. Consultation on knowledge needs

9. The second step of the process that had been presented in document IPBES/5/5 was the consultation on these gaps and the formulation of priority areas for knowledge generation. The task force on knowledge and data and the Multidisciplinary Expert Panel had advised earlier that this consultation could take place in the form of an e-conference and involve all relevant stakeholders, including the scientific community and policymakers.

10. The consolidated and comprehensive list of knowledge gaps identified in the course of the assessment process would provide the basis to structure an e-conference for broader consultation and formulation of knowledge needs.

11. The task group on knowledge generation recommends that the organization of the e-conference could include the following elements:

(a) The consolidated and comprehensive list of knowledge gaps identified in the course of the assessment process could be shared with governments and stakeholders well in advance of the e-conference (e.g. 4-6 weeks) to allow participants in the e-conference to prepare;

(b) The e-conference could be held over a period of 2-3 weeks;

(c) The e-conference is suggested to be chaired by the co-chairs of the respective assessment and to be facilitated by the secretariat. Efforts should be undertaken to ensure the engagement of relevant representatives of the key categories of actors identified for this approach (generators/mobilisers of

knowledge and data, funders of activities generating mobilising knowledge and data, and users of such knowledge) to ensure active participation and focussed results.

12. A final draft document with priority areas would be prepared for endorsement by the Multidisciplinary Expert Panel, taking into account the results of the e-conference. It is envisaged to entail a range of types and granularities of knowledge gaps and needs, with the view to be useful to as broad an audience as possible. Following its endorsement, this document would be made public and shared as widely as possible. It could also form the basis for a scientific publication.

D. Catalysing the generation of new knowledge

13. The third step of the process that had been presented in document IPBES/5/5 was the tailoring of the priority research areas to potential research-funding institutions and their communication to these funding organizations. Earlier, the task force and the Multidisciplinary Expert Panel had considered that the engagement with organizations mobilizing or generating knowledge and organizations funding activities to mobilize or generate knowledge would mainly take place by means of bilateral meetings.

14. The task group on knowledge generation recommends that in addition to the bilateral engagement, a face-to-face meeting bringing together relevant representatives of the key categories of generators/mobilisers of knowledge and data, funders of activities generating mobilising knowledge and data, and users of such knowledge could be considered. A meeting could foster, in particular, collaboration among various actors to undertake activities to address the identified gaps.

E. Institutional arrangements

15. The implementation of the approach would be supported by the task group on knowledge generation within the respective contexts, e.g. a specific assessment.

16. Resource persons to the task group could include representatives of organizations from the key categories of actors (generators mobilisers of knowledge, funders of activities generating mobilising knowledge, and users of such knowledge) to support the implementation of the approach.

Appendix VI

Modalities for collaboration with partner organizations

Organization	Role	Modalities
Future Earth	- Provision of support to the evaluation of indicators regarding their relevance for IPBES assessments - Provision of support in gathering relevant expertise and helping to identify and mobilize specialized experts - Provision of support to the knowledge generation function	- Organization of IPBES-relevant expert workshops - Resource persons to task force - Memorandum of Understanding
United Nations Environment -World Conservation and Monitoring Centre (UNEP-WCMC) in its function as the secretariat of the Biodiversity Indicators Partnership (BIP)	- Provision of technical support to the technical support unit and task group on knowledge and data regarding the use of the core indicators that are provided by members of the partnership	- Management of the interaction between IPBES and BIP members; - Resource persons to task force - IPBES Secretariat participates in steering committee of BIP
Global Biodiversity Information Facility	- Provision of support to IPBES assessments in identifying and accessing relevant biodiversity datasets, in particular with regard to data provision for indicators - Provision of support for catalysing generation of new knowledge, through mobilization of data to address identified knowledge gaps	- Resource persons to task force - Memorandum of Understanding
The Group on Earth Observations – Biodiversity Observation Network	- Provision of support to the use of indicators and data in IPBES assessments	- Resource persons to task force - Memorandum of Understanding
The Food and Agriculture Organization of the United Nations (FAO)	- Provision of support to the use of indicators in IPBES assessments by making available fact sheets for the various indicators, supplying related data and collaborating with the task group on the preparation of visualizations	- Collaborative partnership arrangement to establish an institutional link between the Plenary and UNEP, UNESCO, FAO and UNDP
United Nations Educational, Scientific and Cultural Organization (UNESCO) Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO)	- Provision of support to the knowledge generation function - Contribution of data to the global assessment through the Ocean Biogeographic Information System	- Collaborative partnership arrangement - Collaborative partnership arrangement through UNESCO
United Nations Development Programme (UNDP)	- Provision of support to the knowledge generation function through trialogues on IPBES assessments	- Collaborative partnership arrangement
Inter-American Institute for Global Change Research (IAI)	- Provision of support to the knowledge generation function (through its science programmes)	- Memorandum of Understanding
The Biodiversity Indicators Partnership BioTime	- Provision of support to the use of indicators in IPBES	- Correspondence with the BIP Secretariat or IPBES technical

Organization	Role	Modalities
The University of St. Andrews	assessments by making available fact sheets for the various indicators, supplying related data and collaborating with the task group on the preparation of visualizations	support unit for knowledge and data Acknowledgement as in-kind support in budget documentation and on web site
BirdLife International		
The Commonwealth Scientific and Industrial Research Organization (CSIRO)		
Forest Stewardship Council		
Global Footprint Network		
German Centre for Integrative Biodiversity Research		
Indicators for the Seas programme (IndiSeas)		
Institute of Social Ecology at the Alpen Adria University in Vienna		
International Union for Conservation of Nature (IUCN)		
The Map of Life		
Marine Stewardship Council (MSC)		
Organization for Economic Cooperation and Development (OECD)		
The Netherlands Environmental Assessment Agency (PBL)		
Programme for the Endorsement of Forest Certification (PEFC)		
Projecting Responses of Ecological Diversity in Changing Terrestrial Systems (PREDICTS) collaborative project		
Sea Around Us research initiative		
Secretariat of the Convention on Biological Diversity (CBD)		
Terralingua, the Tropical Ecology Assessment and Monitoring (TEAM) network		
United Nations Statistics Division		
UNEP-WCMC		
Water Footprint Network		
The World Bank		
The World Resources Institute (WRI)		
The World Wildlife Fund (WWF)		
The Yale Center for Environmental Law and Policy		
The Zoological Society of London (ZSL)		